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## HOOSAC TUNNEL.

### HISTORY FROM 1855 TO 1876.

RIGHT OF REDEMPTION BY

### TROY & GREENFIELD RAILROAD CO.

CONDITIONS OF SURRENDER TO THE STATE.—HOW THE MONEY  
OF THE STATE HAS BEEN EXPENDED.

### INTERESTING AND IMPORTANT FACTS.

[REPRINT FROM "BOSTON EVENING TRAVELLER," MARCH, 1876.]

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BOSTON:

1876.



## THE HOOSAC TUNNEL.

In view of the fact that the State of Massachusetts has expended upon the Hoosac Tunnel enterprise nearly seventeen millions of dollars, and that the Troy & Greenfield Railroad Company claims a right, under contract, to redeem the property for a principal sum of two millions of dollars, and has presented a memorial to the legislature, asking the privilege of exercising this reserved right, we propose to publish a series of articles giving a history of the tunnel; and an account of what has been done with the money appropriated by the Commonwealth.

### History of Contract.

The loan act which granted State aid to the Hoosac Tunnel to the extent of \$2,000,000, was passed in 1854, and soon after a contract was made with E. W. Serrell, a New York engineer, under which a small amount of work was done on the approaches of the tunnel and on the western division of the railroad.

Application having been made to Pennsylvania parties to take an interest in the contract and advance capital, the papers were referred to H. Haupt, the chief engineer of the Pennsylvania Railroad, for examination and report. Mr. Haupt visited the tunnel, examined it critically, made inquiries as to the character and standing of Alvah Crocker and other directors, and on his return reported that the work was entirely practicable, the rock in a favorable position for excavation, the directors gentlemen of wealth and high social position, and that it was reasonable to suppose that they would not contract obligations unless confident of their ability to fulfil them; that the contract price was sufficiently liberal and would allow a fair margin of profit, and that if the statements of the contractors as to their liabilities could be relied upon, and the railroad company could fulfil its engagements and pay the cash required under the contract, an addition of \$100,000 to the working capital should be sufficient to carry on the work until the payments from the State would become available.

Mr. Haupt was solicited to take an interest in the contract, and finally consented, on certain conditions not essential to this history.

A new firm was then organized under the style

of Serrell, Haupt & Co., and a new contract made with the T. & G. R. R. Co.

The Troy & Greenfield Railroad Company was not able to fulfil engagements under this contract, the cash payments required by it were not forthcoming, the liabilities of former contractors had been underestimated, a much larger amount of working capital was required than had been anticipated, but instead of abandoning the enterprise the difficulties of the situation stimulated the contractors to increased efforts. The railroad company acknowledging their inability to secure increased subscriptions, or even the payment of subscriptions already made, turned over the whole authority to the chief contractor, as agent for the corporation, to secure and collect subscriptions, to receive all payments from the State and apply the proceeds to the work, to negotiate the State bonds, and, in a word, to do whatever he might consider necessary to prosecute the work successfully.

Another reorganization of the contracting firm was then made. Two of the parties retired, three others became special partners, H. Haupt and Henry Cartwright remained the only general partners. This proved a highly efficient and economical organization. Mr. Cartwright was an engineer of large experience, a thorough accountant and a gentleman of great mechanical resource. To him was entrusted the supervision of the actual work on the tunnel and of the accounts, while Mr. Haupt devoted attention chiefly to finances, engineering, legislation, subscriptions and road construction.

B. N. Farren, who had been a contractor on the Pennsylvania Railroad, was employed as superintendent at the tunnel, and under this organization the work was prosecuted with energy and economy. Every dollar expended after 1855, previous to the payment of the first instalment of the State loan, was provided by or advanced on the credit of the contractors, until the aggregate amounted to nearly \$500,000. This was in addition to a previous expenditure of \$267,000 by the railroad company.

In 1857 Mr. Haupt, seeing no hope of success except in extraordinary personal efforts, resigned the official positions which he held in Pennsylvania, and removed to Massachusetts. In the win-

ter of 1857-8, meetings were held and subscriptions secured from nearly all the towns on the line of road, amounting to \$175,000; a very important success not only for the pecuniary aid thus afforded, but still more on account of the confidence inspired, and the legislative strength thereby given to the enterprise. Of these subscriptions nearly all were paid.

The efforts of the contractors to carry on the work excited the most violent opposition, which, upon being traced to its source, was found almost invariably to emanate from parties connected, with a hostile interest. The contractors were denounced as swindlers, their work disparaged, the railway company discredited, and it became apparent that the object of the opposition was to ruin the contractors by destroying their credit, forcing upon them increased expenditures beyond their resources, and obstructing the payments from the State earned for work accomplished.

These efforts, although unsuccessful for some years in stopping the work, seriously retarded progress, and increased difficulties. A public opinion was manufactured, through the agency of the press, greatly injurious to the contractors, and which culminated, finally, during the administration of Gov. Andrew, in dispossessing them, and assuming the tunnel as a State work, with results that will be more fully exhibited hereafter.

#### **HOOSAC TUNNEL—No 2.**

##### **Legislative Investigations.**

At nearly every session of the legislature, committees of investigation were appointed, with power to send for persons and papers. The results of these investigations by honest, practical, and impartial legislators, was almost invariably a unanimous endorsement of the contractors. This was particularly the case in the last investigation before council and before a joint special committee of both houses in 1862.

##### **LEGISLATION OF 1857.**

In this year a bill passed both houses, authorizing a subscription by the State to a small amount of the stock of the Troy & Greenfield Railroad Co., to enable that company to make certain cash payments to contractors, required by the contract. This bill was vetoed by Gov. Gardner, who characterized the tunnel as a visionary enterprise, advocated by interested contractors and theorizing speculators; that it did not command the confidence even of residents on the line of road, who might be supposed to be

most interested; that although certain towns in Franklin and Berkshire had been authorized to subscribe to the stock by a special act, they had not availed themselves of the privilege, and indicated very plainly that the citizens of the State, who were directly interested, must give greater evidences of confidence in the enterprise themselves, before they could expect more from the State than had been already granted.

The force of these objections was appreciated, and they were subsequently removed. A series of town meetings was held, and subscriptions, in every instance, obtained by more than a two-thirds vote, to the full extent limited by statute of 3 per cent. on the valuation.

##### **\* PAYMENT OF FIRST INSTALMENT OF LOAN.**

The conditions of the Loan Act of 1854 were so onerous that it was hoped and expected by the opponents of the tunnel route, that no parties could be found able to fulfill them and willing to incur the risk. The first \$100,000 of State scrip was to be delivered only after one thousand feet of tunnel and seven miles of road had been completed requiring, as the facts proved, an expenditure by the company and contractors of about \$700,000 in cash.

The act required as a condition precedent to the delivery of scrip that subscriptions should be obtained to the extent of 6000 shares and 20 per cent. "*actually paid in.*"

The amount of such payment, \$120,000, was all that was required by statute, but the actual payments and expenditures in cash available as security had been six times as great as the act required. Notwithstanding this fact, the company received reliable information that the Attorney General had been urged to rule, and probably would rule, that an "*actual payment*" meant a *cash* payment and not a payment in labor and material, even if the cash cost and value thereof was many times as great.

This technical quibble was supposed to have been invented to ruin the contractors and stop the further progress of the work; but it was fairly met. The contractors raised \$100,000 in bank notes, paid them in presence of the directors to the treasurer on account of subscription to stock, and received them back again on an engineer's estimate on account of work done and materials furnished.

This transaction, which complied with the letter and spirit of the act, under a most harsh and unreasonable construction of the Attorney General, was denounced in the newspapers as a fraud; and it is to be regretted that even so respectable a paper as the *Nation*, not long since published an article on the Hoosac Tunnel, con-

taining a repetition of old and long since refuted slanders against Haupt & Co., and many glaring errors of fact, which it would occupy too much space to answer.

#### LEGISLATION OF 1860.

The original Loan Act of 1854 contained conditions of no practical value as affording security to the State, and yet embarrassing in their effects on the progress of the work. Some improvement was made in 1859; and in 1860 a committee of investigation was ordered by the House, of which Hon Moses Kimball was chairman, and Amos B. Merrill, of Boston, a prominent lawyer, was a most laborious and efficient member. To these gentlemen, and especially to Mr. Merrill, is chiefly due the credit of originating the Act of 1860, prepared after many weeks of patient labor and investigation, and admirably adapted, while protecting the interests of the Commonwealth, to relieve the company from embarrassment and enable them to complete the railroad and tunnel, without exceeding the limits of the two million loan.

Strange as it may now appear in view of a present expenditure of nearly seventeen millions by the State, the framers of the bill of 1860 after thorough investigation were convinced that the provisions of that act would enable the corporation to complete the tunnel without further aid.

#### THE GROUNDS FOR THIS OPINION.

After a personal examination of the contractors, their assistants and supervisors and such other sources of information as were accessible, the fact was conclusively established that a tunnel 15 feet wide by 19 feet high, containing 10 cubic yards per lineal foot, was not costing the contractors more than \$5 per cubic yard, or \$50 per lineal foot. That there was no reason to expect any large increase of expense as the work progressed. That as the tunnel was less than 25,000 feet in length an advance of \$50 per foot, or \$1,250,000, was sufficient in the hands of the contractors to complete it under the conditions and with the dimensions prescribed by the act of 1859. The committee considered that the loan of \$2,000,000 on the tunnel, so far from being insufficient was actually more than was required; this opinion was fully sustained by the testimony of D. L. Harris of Springfield, and others, who repeatedly demonstrated or attempted to demonstrate by figures that the tunnel was not costing Haupt & Co. over one million of dollars. The committee concluded that the eastern division of the road was the weak point that required reinforcement. Un-

der this conviction they took \$650,000 from the tunnel and applied it to the road, the original loan having been exclusively applicable to the tunnel.

#### OTHER CONDITIONS OF THE ACT OF 1860.

The committee regarded the contract made by the Troy & Greenfield R. R. Co. with H. Haupt & Co., as unsafe for the State, as it gave the contractors unlimited control over location and construction. They, therefore, required a relocation of the road under the supervision of a competent State engineer, to be appointed by the Governor and Council. They prescribed the characteristics of the road, which must be such that an engine of any given capacity could haul as many loaded cars over this division as over any other division between Troy and Boston. They provided for monthly estimates by the State engineer so as to distribute the two millions of dollars over the whole work of tunnel and road in proportion to progress. They required the purchase of the Southern Vermont railroad, which secured this link from the hands of hostile parties, and at the same time relieved the contractors of an oppressive weight of floating debt, by returning \$200,000 of their capital that had been used in the construction of this road.

The committee appeared to recognize the fact that in sustaining and strengthening the contractors they were protecting the interests of the State and securing most effectually the object for which the loan was originally made.

#### IMPORTANT QUESTIONS.

*Could the tunnel have been finished by the T. & G. R.R. Co. for \$2,000,000? and if finished of the dimensions prescribed in the act, would it have accomplished the purpose for which it was designed?*

These are important questions; they will be answered affirmatively and the reasons given.

The advance to the company was \$50 per lineal foot, or \$5.00 per cubic yard, and this was shown, from the evidence of the contractors, their books, assistants and superintendents, to be sufficient to cover the cost. As the work in the tunnel progressed, the only increased expense would have been the increased haul, but even at the extreme distance of  $2\frac{1}{2}$  miles this increased cost, at 2 cents per ton per mile, would have added only 10 cents per cubic yard, or an average of 5 cents. As an offset to this Mr. Haupt, at the time of the suspension of the work in 1861, claimed that he was far in advance of other parties in the construction of tunnelling machinery, his plans were comparatively inexpensive, and with the discovery

and use of nitro-glycerine would no doubt have accelerated progress and reduced expenses far more than the increase from haul and other causes.

Of course the contractors never intended to construct a Deerfield dam or central shaft, their uniform protest against such expenditures are on record, and in these opinions nearly all practical engineers concur, the Shanlys included.

As compared with the cost of tunnelling in other localities \$5 per cubic yard was not only a full but an outside allowance. The average cost of the tunnels on the Chesapeake & Ohio Railroad, finished since the war, was considerably less than \$4 per cubic yard, and the Lick Log Tunnel on the Western North Carolina Railroad, through rock identical with the Hoosac, but much more wet, and of the same dimensions nearly as the Haupt Tunnel, cost the contractor, Chas. L. Kalmbach, only \$2.25 per cubic yard. This tunnel was excavated with the use of nitro-glycerine, yet the roof was not injured, not a foot of arching was required and the form of section was maintained perfectly.

Mr. Kalmbach is represented by the U. S. Engineers as one of the most thoroughly practical and successful engineers in the country. His latest work has been on submarine operations, in James River, by the use of diamond drills and nitro-glycerine. His specialties are tunnelling, drilling by machinery and the manufacture and use of nitro-glycerine. A communication from Mr. Kalmbach states:

"In the year 1870 I contracted to excavate the Lick Log Tunnel on the Western North Carolina Railroad through hard irregular stratified gneiss at \$5 per cubic yard. The dimensions were 15 by 21 feet, or nearly 11 yards per lineal foot. The work was done by hand drilling, nitro-glycerine and common power were the explosives used. We drilled 3 feet of  $1\frac{1}{2}$  inch hole to the cubic yard excavated, and used 2 ounces of nitro-glycerine and  $3\frac{1}{2}$  ounces of powder to the cubic yard excavated. The total expense did not quite reach \$2.25 per cubic yard. I am confident that it would not have exceeded \$1.75 if the tunnel had been 25 instead of 15 feet wide. I visited the Hoosac Tunnel in 1871 and found the hardest rock there exactly similar to the Lick Log, but it struck me that the work was being done utterly regardless of expenditure of life, drilling, nitro-glycerine and money, and without any regard to the safety of the roof."

Engineers and contractors familiar with tunnelling will not hesitate to testify that \$5 per cubic yard is an outside price to cover the cost of removing such rock as is found in the Hoosac Tunnel, of dimensions 15 by 19 feet, and consequently the cost of 25,000 feet of such tunnel should not exceed \$1,250,000, and we are assured

that contracts could be made with responsible parties at that price now for similar work.

#### **HOOSAC TUNNEL—NO. 3.**

##### **Would a Single-track Tunnel at the Hoosac Mountain have Satisfied the Demands of Commerce?**

I may be asked, in reply: "What is the use of a double-track tunnel on a single-track railway?" It may be many years before the balance of the line between Troy and Boston will be double-tracked; when it is, even then a single-track tunnel of  $4\frac{1}{2}$  miles can be operated, we are informed, without serious inconvenience to a limit of at least four millions of tons annually. This limit may not be reached in fifty years. It is four times as great as the maximum has ever been on the corresponding division of the Boston & Albany R. R. Manager Prescott, in his recent report, expresses the opinion that a single track will accommodate all the business on the Troy & Greenfield Railroad for several years. Why not, then, a single track in the tunnel, also?

But suppose a loose rein be given to the imagination, and a time in the distant future be conceived when a single track tunnel would be inadequate for the requirements of business, the true construction would then appear a twin or parallel tunnel, which could be commenced at 50 or 100 points, would be drained through the first tunnel, and consequently would cost much less and require but little time to construct, and if not constructed until it became necessary, the saving of interest alone on the basis of present actual cost would have paid possibly twenty times the cost of the enlargement.

##### **VENTILATION OF THE TUNNEL.**

Much has been said about ventilation, and the necessity of a central shaft to serve as a chimney. Practical engineers consider this position absurd. The universal practice is to close up shafts after tunnels are completed. They interfere with ventilation. Mr. Farren has closed the central shaft, because it interfered with the ventilation, which has been much improved thereby. If a large fire be maintained in a shaft, it will act as a chimney, but not otherwise.

Mr. Haupt frequently argued before committees that the true ventilator of a tunnel is a train. In a tunnel of moderate dimensions the train acts like a piston in a tube: the air is set in motion half a mile or more in advance of an approaching train, and a vacuum is created behind it; the air is completely changed by every train, and

much more perfectly in a single track tunnel than in a larger one.

*Well, accepting these explanations in regard to the tunnel as plausible, how about the location and construction of the road, which required so many millions of dollars to alter and improve?*

Never was an expenditure more unnecessary or wasteful than in these so-called improvements.

The location, in 1860, was made as has been stated under the supervision of the State engineer, who was required by law to make and file a new location of the road. Unusual care was taken, by borings at every station, to determine accurately the amount and kind of material, as a basis for the distribution of the monthly appropriations. The characteristics were prescribed in the act of 1860, and in actual location as appears from the testimony of the State engineer the resistances from grade and curvature were kept considerably below the prescribed limits. The capacity of the Troy & Greenfield Railroad for transportation was greater than that of any other division of the line between Troy and Boston, while the actual tonnage from its position would necessarily be less.

Now it may be asked what has been gained by the expenditure of millions in altering and improving the line along the Deerfield? Has the capacity of the road for business been increased? Can an engine haul more cars? Can the cost of movement be reduced? Nothing of the kind. If the capacity of the division was already greater than that of any other in the line, why improve it until other divisions were first improved? Would the capacity of a chain for sustaining a weight be increased by enlarging a link in the middle and leaving the others of original dimensions?

But the apologists for this waste say, "Well, any way we have a first-class road." A first-class road! It would have been still more nearly first-class if a straight line had been located from the tunnel to Greenfield, and money and time enough would have constructed it, but the practical question is would it pay? and has it paid to throw away millions on a portion of a road which had already a greater capacity for business than the balance of the line of which it formed a part. The capacity of a road is limited by the points of maximum resistance from grade and curvature, and expenditure within reasonable limits to reduce these maximum resistances and increase the capacity of the road is eminently wise and proper, but to spend money upon other

points where the capacity of the division is unaffected and where no practical benefit can result therefrom would be unwise, wasteful and improper.

The original location, made in conformity to the requirements of the act of 1860, was all right. If the company and contractors had been let alone in June, 1861, the road would have been completed and in operation to the tunnel before the fall of that year, the masonry finished, the banks protected from river currents, and the small amount of trestle work filled before it could have become dangerous. To do this only required an additional expenditure, according to the estimate of the State engineer, of \$108,000, at the time of suspension, and an amount sufficient for this purpose was still unexpended out of the \$650,000 appropriated to the road.

In any aspect in which it can be viewed the act of 1860 was eminently wise and practical, just to contractors, safe for the State and creditable to the Kimball committee, who reported it.

*Could the T. & G. R. R. Co. have completed the tunnel and road under the act of 1860 without further aid from the State?*

It was the opinion of the framers of the act of 1860, after full investigation, that they could. The existing act was modified to fulfil this condition and accomplish this object, and although the assertion may, to those who have not carefully considered the matter, seem incredible in view of the enormous expenditures by the State, the facts will nevertheless prove that the expectation of success was at least reasonable if its certainty had not demonstrated absolutely.

The contractors were to receive, in addition to the \$2,000,000 from the State, all the cash from town and other subscriptions, \$900,000 of company bonds, and the balance of \$4,000,000 in stock.

The advances by the State of \$50 per lineal foot, fully covered the cost of the work on the tunnel, as has been explained.

It required only an additional expenditure of \$108,000 by the State engineer's estimate to lay the track and put the road in operation to the east end of the tunnel, when, in connection with a stage line across the mountain, there would have been some income to pay expenses and interest until the completion of the tunnel.

The contractors had almost unlimited credit; even in 1857 we are informed that their paper had never suffered protest; their floating debt, by the purchase from them of the Southern Vermont R. R. had been almost extinguished, and they had the reserve of two

millions of dollars in stock, bonds and town subscriptions, in addition to the State loan to fall back upon. Can there be a reasonable doubt, then, that if existing conditions had been maintained they would have been abundantly able to fulfil all obligations and complete their contract? The road was taken from their hands, as will be shown, by an arbitrary exercise of power, the plans were changed, the tunnel enlarged, the location of road altered, and many expenditures made for objects not essential, and which do not appear have resulted in any practical benefit whatever.

Had the act of 1860 remained operative and the Troy & Greenfield corporation and its contractors retained possession, no reasonable doubt can be entertained that the road would have been completed on the original loan of credit. The interest was paid by the company, the principal was protected by the sinking fund, and not a dollar of tax would have been imposed upon citizens of the Commonwealth. Now by the unfortunate change of policy, the assumption of the road by the State and the management of officers with whom economy of expenditure was not a primary object, the cost has been inflated, with interest, to \$16,857,501.99, of which \$3,203,628.99 represent interest on expenditures.

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#### **HOOSAC TUNNEL—NO. 4.**

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##### **Operations Subsequent to 1860—Cause of Suspension in 1861.**

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This chapter in the history of the tunnel enterprise, would most gladly be omitted, were it not so interwoven with the equities of the case now under consideration by the public, that without it no correct opinion could be formed. We have no wish to write a syllable in disparagement of that great and good man, whom Providence removed at the zenith of his fame, the War Governor of Massachusetts. Energetic, patriotic, talented, and inflexibly honest, his great fault was, that confiding in friends whose judgment he respected, and sensitive and suspicious in regard to every thing upon which the slightest cloud could rest, he had become so thoroughly impressed with a conviction that the interests of the State were not safe in the hands of the tunnel contractors, that all the influence of his Council could not induce him to change this opinion, and he insisted with that inflexible tenacity of purpose for which he was distinguished, that the work must be carried on, if at all, through the

agency of officers appointed by the Commonwealth.

Although the results were unfortunate the intention must be respected, the error arose from an honest desire to secure to the State a full equivalent for its expenditures, and it is gratifying to know, and we are assured it can be confirmed by living witnesses, that Governor Andrew before his death admitted that he had been in error, and had done General Haupt great injustice. Hon. F. W. Bird also, with that regard for truth and right which characterizes him, made similar acknowledgments openly on the floor of the House in 1867. Public opinion at last seems disposed to extend to the tunnel contractors that justice which through persistent and interested misrepresentations has been so long delayed.

The record will be given as it exists, with no desire to censure any one, but simply to communicate necessary and important facts.

The act of 1860 so greatly strengthened the hands of the contractors that for a time their enemies abandoned the field, and allowed them to remain unmolested, but the respite was not of long duration. A new executive was called to fill the chair, who believed that the interests of the State were not fully protected, and that a change of management was required.

The Council, who knew the contractors, had entire confidence in them; the Governor, who did not know them, had none. He removed the State engineer, appointed a successor, who changed the plans and imposed new requirements and conditions, to which it was impossible for the contractors to conform, and withheld \$100,000 from their estimates for work done under his predecessor. The contractors suspended operations and appealed to the Governor and Council for protection and redress. An investigating committee was appointed by the Governor. Their report fully endorsed the contractors and censured the State Engineer, whose acts were declared to be in violation of good faith. An order reported by the Committee of Investigation to require the State Engineer to revise his estimates and conform to the agreements and prices of his predecessor, the Governor refused to put to vote; declared that the committee had transcended their authority, and determined to order a re-hearing before the whole Council.

At this second hearing, by some omission, probably unintentional, no notices were sent to the railroad company or the contractors, and they were neither present nor represented. The hearing was entirely *ex parte*. Some of the profes-

sional friends of the State Engineer gave opinions, which the Governor considered as sustaining his action, but the Council differed in opinion from His Excellency and presented a protest against his action. This protest, having been refused a place upon the records of the Council, was published in the papers of the day. It was in the words following, to wit:

*Protest of Council against the Action of Gov. Andrew.*

COMMONWEALTH OF MASSACHUSETTS,  
Executive Department, Council Chamber, }  
Boston, Dec. 26, 1861.

In the matter of the Troy & Greenfield Railroad Company, the undersigned members of the Executive Council, dissenting from the opinion of his Excellency the Governor, given Sept. 26, 1861, and his reasons therefor, so far as he endorses the official policy of the present State engineer, desire to place on record the ground for such dissent as follows:

It is our opinion that the good faith of the State was lawfully pledged by the first engineer appointed under the act of 1860 to the estimates agreed to by him which became the basis for the sub-contracts for the building of the road, and that no succeeding engineer could rightfully "impose new requirements" or change the basis in reference to work done and materials furnished previous to his appointment—nor afterwards until authorized so to do by the Governor and Council who alone are empowered by law "to correct abuses, remedy defects and enforce requirements, by withholding scrip or imposing new requirements as the interests of the Commonwealth shall in their opinion require."

This seems to us to be an interpretation of the law which best accords with the spirit of the statute without infringing upon its letter and the one best adapted to serve the interests of the State.

(Signed)

HUGH W. GREEN.  
E. C. SHERMAN.  
JOEL HAYDEN.  
JOHN I. BAKER.  
JAMES RITCHIE.  
JAMES M. SHUTE.  
OAKES AMES.

The original protest, with the actual signatures of seven out of the eight members of Council, is in the possession of a gentleman of Boston, and is now before the writer; on the back is the endorsement of the Councillor who presented it:

"Presented in Council Dec. 31, 1861, with a motion that it be entered on the record. His Ex-

cency refused to receive it or allow the motion to be put, on the ground that no matter could be brought before Council except by him, and ignoring the fact that this subject had been so brought before the Council by him and no vote taken on it."

In consequence of the refusal of the Governor to receive this protest, or allow it to be entered upon the minutes, the paper, with all the signatures attached, was published in the Boston *Post* of Jan. 23, 1862, accompanied by explanations, reflecting very severely upon the action of His Excellency as illegal, unconstitutional and discourteous to his official advisers, claiming that a privilege of entering on the record a dissent guarantee to each member by the constitution had been denied to seven-eights of the Council.

This publication, now before the writer, states that the State Engineer, appointed by the Governor, sent an assistant to revise the estimates of his predecessor, and that his report rather increased the amount due contractors. He was not satisfied with this result, went himself with another assistant, and after a full examination the result of their figures did not materially differ from the rejected estimate. The State Engineer was still dissatisfied, and, "as figures and facts would not produce such a result as was desired, he proceeded arbitrarily to cut down the estimate and to do without reason what he could find no proper reason to justify. On this estimate for services rendered under the superintendence and according to the requirements of his predecessor, about \$100,000 were withheld, compelling an immediate suspension of the road on the eve of its completion, and when a further expenditure of only \$103,000 was required to place the road in running order, and thus provide the State with a living and valuable security for its advances,"

After this protest no further action could be taken. The Governor sustained the State engineer, and the Council the contractors. All hands were discharged from the road and all operations suspended. When the legislature met in 1862 the condition of affairs was reported, and a joint special committee appointed, of 7 from the House and 3 from the Senate, to whom the whole matter was referred.

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#### HOOSAC TUNNEL—No. 5.

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#### Legislation of 1862.

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The investigations of the special committee extended over a period of three months, with

more than twenty public hearings in the Green Room. Memorials protesting against further aid were presented. Gov. Boutwell was employed as counsel by the memorialists; yet, notwithstanding these efforts the decision of the committee was unanimous in sustaining the contractors and condemning the action of the State. They reported a bill which would have reinstated the company in possession and enabled them to resume work, but information was communicated that this bill could not become a law, and that no other would be favorably considered that would continue the contractors, on the T. & G. RR. Co. in possession, but an act would be approved to put the road in the hands of commissioners.

It is important that the situation at that time shculd be understood, as it has an important influence upon the equities connected with the re-served right of redemption.

It was the opinion of counsel that the State, by a foreclosure of mortgage, could not get possession under three years; and it was extremely doubtful whether the State could take advantage of a default on the part of the railroad company, which, in the opinion of the Executive Council and of the investigating committee, had been caused by her own act in violation of arrangements having the force of contracts. The consent of the corporation was therefore indispensable to an amicable surrender of possession to the State, and an early resumption of the work.

#### CONDITIONS OF SURRENDER.

After several conferences it was agreed that the State should be put in possession of the property for the purpose of continuing the work on certain conditions, the principal of which as given in the words of the act itself were:

1. "That the right of redemption shall not be barred until ten years have elapsed after said railroad and tunnel are completed, and the same opened for use."

2. "That all expenditures and advances made under and by virtue of this act, shall be on account, and form part of the two millions of dollars authorized to be loaned in State scrip to the Troy & Greenfield Railroad Co., by chapter two hundred and twenty-six, of the acts of eighteen hundred and fifty-four; and said expenditures and advances, together with all sums hitherto advanced to said company, excepting the sums advanced on account of the Southern Vermont Railroad, shall not exceed in amount the said two millions of dollars."

3. "No lease shall be made of the portion of the road, east of the tunnel, for a term exceeding six years."

#### REASONS FOR THESE CONDITIONS.

It was first proposed to give the company the right of redemption for 10 years, but the repre-

sentatives of the company in these conferences objected that in the hands of the State the tunnel would not be finished in 10 years. The proposition was then amended to 10 years after the completion of the tunnel, to which, after discussion, the addition was made of 10 years after completion and opening for use.

It may appear very extraordinary that provision should have been made in the act of 1862 for the payment of claims of sub-contractors and not of the principal contractors, Haupt & Co., whose claims in equity might have been considered as at least equally strong. Such payment was insisted upon for some time, but the answer was that any appropriation for their relief would defeat the bill, that justice would be done to them at some future day, but it was useless then to attempt it.

The second condition of surrender was that the expenditures by the State were to be limited to two millions of dollars. This was made a *sine qua non*, without which the right of redemption would have been valueless, and was inserted expressly for its protection. It was urged on the part of the corporation, that it had been clearly and repeatedly demonstrated, that in their hands and under the economical and practical management of their contractors, the two millions of dollars loaned by the State was amply sufficient to enable them to complete the road, but that all experience in State management would indicate a probable large increase of expenditure, and if the cost should be increased the right of redemption could not be exercised, and would be valueless.

The force of this objection was admitted and the expenditures were limited and restricted to \$2,000,000.

The third condition was also designed to protect the right of redemption. The estimated time required to complete the tunnel was six years, and the State was prohibited from making any lease that would extend beyond that time.

This act was passed with these conditions. It was accepted by the company and has never been modified or repealed. The consent of the company was never asked to any changes of plan or increase of expenditures beyond the limits prescribed. The contract stands unchanged, and the good faith of the Commonwealth requires that it shall be executed according to its terms.

Although the Attorney General has given an opinion that the company in exercising the right of redemption must pay the full cost of the work to the State, still such opinion is so entirely at

variance with the terms of the contract as stated in the act itself that it cannot be supposed that either the legislature or the people of the Commonwealth will accept it as the basis of their action.

It is very certain that the intention of the contracting parties in 1862 was, that the railroad company should, for ten years after the completion of the tunnel, have the right of redemption by the payment of \$2,000,000, and no *ex parte* legal opinions at this day can alter the fact and take from a private corporation and appropriate without compensation to public purposes a property upon which more than a million of dollars of individual capital had been expended. No man acquainted with the history of Massachusetts will assume that she will repudiate a contract made under such circumstances.

The acceptance of the act of 1862 by the stockholders made it a contract. The State since that time has held the property simply in trust, and upon tender of the specified sum is bound to restore it, unless by some satisfactory compromise, acceptable to a majority of the stockholders, the right of redemption shall be surrendered. At no period before the completion of the tunnel could the railroad company interpose and claim the resumption of their suspended rights; nor could they, with any propriety, presume that the Governor and Council did not know the law, and inform them and other State officials of statutory provisions, restrictions and limitations, of which their duty required them to be, and of which they no doubt were fully cognizant.

#### **HOOSAC TUNNEL—NO. 6.**

**If the Troy Greenfield Railroad Co. Could Have Finished the Railroad and Tunnel for \$2,000,000 why has the State Expended \$17,000,000?**

It is not claimed that the Rail Road Corporation could have completed the entire railroad and tunnel for \$2,000,000, but that they could have done it with the aid of the \$2,000,000 of State bonds in addition to other resources which the action of the State subsequently rendered valueless. These resources were the credit of the contractors themselves which had enabled them in 1857 to carry a floating debt of more than \$250,000 without protest. This credit was destroyed by the action of the State, which practically confiscated their property, and left them with large

debts and withheld the payments for work done on which they had depended.

At the time of the suspension in 1861 the firm of Haupt & Co. was in a very flourishing financial condition, their credit almost unlimited, reported as A 1 in commercial registers, their floating debt greatly reduced by the purchase for \$200,000 of the Southern Vermont Railroad, and in addition to the \$2,000,000 from the State they were to have under their contract \$2,000,000 more in cash from town and private subscriptions, company bonds and stock, which securities long before the completion of the tunnel would have become available as collateral, and after its completion would have commanded at least par. The resources of the contractors were therefore \$4,000,000 and not \$2,000,000, but the State by its action blotted at once out of existence \$2,000,000 of these assets and lost the support that the financial credit of the contractors had given the corporation.

The road which the contractors were required to build, and which they were building, was, according to the testimony of Col. Lincoln, a road finished as new roads are when first brought into use. Not absolutely perfect, as tested by the highest standards, but a road well adapted for the safe and convenient transportation of passengers and freight; a road fulfilling all the conditions as regards characteristics required by the statute under which it was constructed; a road which by such gradual improvement as could be made in its ordinary operation without any increased charge to capital could be brought to the full standard of a first class road before the want of such improvement could cause expense, damage or inconvenience. A road presenting less resistance from grade and curvature and, as a consequence, possessing greater capacity for business than the Fitchburg and Vermont & Massachusetts, with which it connected.

At the time of the suspension in 1861 such a road, according to the testimony of the State engineer, could have been completed and put in operation to the tunnel for an additional expenditure of \$103,000, the funds for which were still in the treasury.

As to the tunnel itself it requires no further statement to convince those who have read the preceding articles that the advance of \$50 per lineal foot by the State was amply sufficient to cover the cost of the work through the solid rock.

After providing, therefore, for the completion of the road to the tunnel and for the solid portions of the tunnel itself, including all except 2000 feet at the west end, there would have remained in

the hands of the Troy & Greenfield Railroad Company on its contractors \$2,000,000 more in bonds, stock, town and individual subscriptions, applicable to repayment of contractor advances extra cost of west end, interest and incidentals

The road east of the tunnel could have been leased for \$10,000 a year in addition to one-half of the net receipts, and an income was also received from the lease of the western division. What the income would have amounted to cannot be accurately determined, but call it \$50,000. This would take care of the interest on one million of 5 per cent. bonds of the State. Suppose after the completion of the road it should have required ten years more to complete the tunnel, the interest on the second million during this time would have been \$275,000, the payments into sinking fund \$100,000, and for demoralized rock at west end \$300,000, making a total of \$675,000 to meet which the corporation had \$2,000,000 of assets, all available before the tunnel was completed.

To assume that the contractors could not have carried the work through on this showing of assets seems unreasonable. The profits would probably have exceeded a million of dollars; it is true they would have been in stock, but a stock which, if the action of the State had not destroyed its value would have been worth par, at least, and probably much more.

*If the T. & G. R. R. Co. could have completed the tunnel and railroad within these limits, how can the enormous increased cost under State management be accounted for?*

It is difficult to explain how the whole of such immense sums could have been expended, but a large portion can be readily accounted for.

State works have almost invariably cost greatly in excess of similar works under private management, and the maximum of economy is reached when, as in the case of Haupt & Co., the contractors were required to provide a large portion of the capital and supplement all deficiencies in the estimates.

The increased expenditures were fully anticipated by the representatives of the company, and protection claimed and secured by the conditions of redemption inserted in the act of 1762.

To proceed to particulars, all the shops, offices, stables and shanties used by Haupt & Co. were temporary structures of rough, unpainted boards, intended to last only until the tunnel was completed. The State substituted permanent buildings of stone and brick of an expensive character, although the cheap buildings answered perfectly the purposes for which they were intended.

The contractors, Haupt and Cartwright, were both practical engineers, and with their superintendent, B. N. Farren, all perfectly familiar with the details of tunnelling and able to master readily the difficulties of the situation. Gen. Haupt, by special invitation of the Royal Polytechnic Society, visited England in 1867, to explain his methods of tunnelling by machinery, and received the highest prize of the society; also a premium at the Paris Exposition; and a vote of thanks for a lecture on tunnelling before the British Association for the Advancement of Science.

Of the State Commissioners and their agents who succeeded to the charge of the work, however accomplished they may have been in engineering, not one had any practical experience in tunnelling, and after wasting fabulous sums of money and some years of time at the west end, B. N. Farren was called upon as the Hercules to lift the State from the mud, and a contract given him at a price eight times as much per foot as had been advanced to Haupt & Co. In taking this contract, Mr. Farren was wise enough to stipulate that he should not be interfered with and embarrassed by State engineers, but must be allowed to exercise his own judgment.

The Deerfield dam was another useless expenditure. If a dam had been required at all a country millwright could have built one for \$10,000, which would have answered every purpose. But the Commissioners should have known that the Deerfield river would dry up in summer and freeze in winter; that it could not be relied on for power, and that steam would be required in the end. A quarter of a million of dollars in a cutstone dam was thrown away.

The buildings, turbines, air compressors, and other expensive machinery, was not required in Haupt's plans of tunnelling, which were comparatively inexpensive, and yet, it is claimed, would have secured perfect ventilation and rapid progress.

The central shaft was another very great and very useless expenditure. Mr. Haupt repeatedly argued against it before legislative committees, and in his opinions in regard to its uselessness the Shanly's fully concurred. Mr. Farren has now closed the shaft because it interferes with ventilation, as practical men always predicted that it would. This shaft has been the cause of great loss of life and of useless expenditure of capital, without greatly accelerating the progress of the work.

Then next item of great and apparently unnecessary expenditure is the enlargement of

the tunnel for double track, when the single track tunnel would accommodate all the business of the line for possibly 50 years, by which time the saving of interest on present outlay would have paid for the enlargement more than ten times over. Not only was the enlargement for double track a mistake, but the form of section was the most expensive possible to excavate and the worst possible for stability. Instead of a regular arch the roof was made flat and the corners sharp, subjecting the contractors, Shandtys, to increased expenses to do a positive injury. Then again, the excessive use of nitro-glycerine and the explosion of heavy charges near the roof has shattered and crushed the rocks and rendered arching necessary. A single track tunnel excavated with the judicious use of nitro glycerine and powder would not have required a single foot of arching in any part of the rock excavation.

#### **HOOSAC TUNNEL—NO. 7.**

In former numbers we have endeavored to present such facts in connection with the Troy & Greenfield Railroad Company, and the work with which it has been connected, as to enable our readers to understand the grounds for the claims as set forth in the memorial. The tunnel literature for the last quarter of a century fills many volumes. In the brief sketch we have given, only the salient points bearing upon present issues have been presented. There was much detail in the investigations of 1860, 1861, and 1862, in reference to engineering questions of slopes, trestles and bridges, which we do not propose to review. The testimony was in some respects conflicting, but there was one very material point that seems to have been clearly established, that the act of 1860 took the control of location and construction out of the hands both of the railroad corporation and of the contractors, and provided for the appointment by the Governor and Council of a State engineer, one of whose first duties was to cause to be made and filed an entirely new location of the road, and as it was also his duty to distribute the unexpended portion of the State loan over the whole road and tunnel in proportion to progress, it was necessary for him, as preparatory to such distribution, to determine every engineering point and decide every question of plan, location, or construction. If any defects existed in any of these particulars, as have been charged, the responsibility rested with the State engineer and not with the corporation,

its officers or agents, and the unsparing condemnation that was visited upon them seems to have been undeserved, for if the location and construction of the railroad and tunnel were defective, as the advocates of the State supervision attempted to show, in palliation of the arbitrary action of the State, the fault, if any, was not with the corporation but with the State engineer, and the testimony of this officer was that he required a road constructed as new roads usually are when brought into use.

The record does not show that previous to 1861 there had been any failure of the corporation to comply with the provisions of the statute, and at this time it seems to have been the opinion of the Executive Council, as also of an investigating committee of the legislature, that the suspension of the work was caused by mistakes or improper acts of an officer of the State, rather than from any fault of the company, and it appears at this day to have been rather harsh treatment to deprive a corporation of its road and suspend for a period of 14 years the exercise of its corporate privileges and franchises, as a consequence of acts for which it was not responsible. It was to be expected that in yielding to the demands of the State for a surrender of its property, the corporation would insist on conditions of redemption adequate for its protection.

The Attorney General, in an opinion given in 1874, recognizes as a fact that the corporation had expended more than a million of dollars in excess of the advances by the State. If the State shall now refuse to recognize the right of redemption, will she not be bound to make restitution to towns and individuals. On what ground, constitutional, equitable or otherwise, can a Commonwealth appropriate to public uses private property without compensation? We understand that there are between 1100 and 1200 stockholders on the books of the Troy & Greenfield Railroad Company, including several of the towns in Franklin and Berkshire counties. Can the State rightfully confiscate the property of these towns and of her citizens?

We have now presented our readers with a history of operations under the Troy & Greenfield Railroad Company and its contractors. They commenced the work under many and great discouragements; the tunnel was the object of ridicule; it was characterized in dignified official documents as visionary and impracticable, a popular poet thought it time to order ascension robes when the first wheel rolled through the Hoosac Tunnel, but Haupt & Co. had faith and manifested it by works; they proved the tunnel prac-

icable by making progress and then the tune of their opponents was changed, the cry then was, "these men are making too much money, two millions of dollars is an excessive price; they are swindling the Commonwealth." The railroad company thought they were making a very good bargain indeed when they secured parties of high position and responsibility to undertake the whole road and tunnel for \$4,000,000, half of it in company bonds and stock. No Massachusetts contractors were willing to undertake the work at that price, they had the opportunity but did not use it and it is too late now to assert that the price was extravagant, when under State management the expenditure has been, *in cash*, four times as great as the contract made by the corporation without securing thereby such improvement in location and construction, so far as the records show, as will cheapen transportation and increase facilities for the business at command.

In our second article we recited the legislation from 1857 to 1860, and the reasons for the radical changes in the conditions of the loan act made by the Kimball committee in 1860, an act the object of which appears to be to solve the problem of securing the completion of the Troy & Greenfield Railroad and Hoosac Tunnel without increasing the two million loan and of protecting the interests of the State in regard to location and construction, by the appointment of a State engineer by the Governor and Council. These objects appeared to have been as effectually secured as it was possible by legislation. The railroad company and contractors appeared satisfied with the amount of the loan, never asked an increase, and always represented it as sufficient, while the road required by the State engineer fulfilled the requirements of the act and the demands of business, and, as the testimony proved, had a capacity for transportation superior to that of any of its connections east or west.

In the third article the questions are considered whether a single track tunnel would have satisfied the demands of commerce, and whether the company could have completed the road and tunnel without further aid from the State. An affirmative answer in both cases would seem to be warranted by the facts stated.

The fourth article gives the causes of suspension in 1861, the subsequent action of the State authorities and the protest of Council against the action of the Governor.

The fifth refers to the legislation of 1862 and the conditions under which the property of the company was surrendered to the Commonwealth,

and explains the reason for the limitation of expenditure to \$2,000,000.

The sixth attempts to explain the apparent absurdity of the claim of the corporation that under their management the work would have been completed without an increase in the \$2,000,000 loan, and accounts in part for the excessively increased expenditures under State management.

We have now given all the facts that appear to be really material to enable the public to judge of the merits of the claim of the Troy & Greenfield Railroad Company. The subject is one of the gravest importance to Massachusetts.

The commissioners and other representatives of the State appear to have ignored entirely the existence and rights of the corporation, and have proceeded as if the ownership of the tunnel and road by the State was unquestioned. If after the expenditure of two millions of dollars the commissioners had asked for a convention of the stockholders, and induced them, by a stock vote, to remove the limitations and restrictions of the act, the interests of the State would have been protected; but this was not done, and now the corporation very naturally insists upon their reserved rights and disclaim responsibility for expenditures, which they consider wasteful and improper, and over which they had no control.

It would no doubt be very unpleasant for the tax payers of the Commonwealth to surrender a property on which they had expended seventeen millions, for the sum of two millions; but if this was the contract, if these were the conditions on which the State accepted the surrender, took possession, and assumed the trust, — if the State changed the plans without consent of the corporation, and made excessive, extravagant and wasteful expenditures, as is claimed, in Deerfield dam, central shaft, reconstructing of road along Deerfield, and in many other ways, the corporation denies that it is for such acts in any way responsible. In the hands of their own engineers and contractors, they assert that they had conclusively established the fact that the original two million loan was sufficient to complete the route in a manner that would have fully met all the requirements of business, and given the Troy & Greenfield division a capacity equal to that of any other portion of the line. Conceding that the expenditures by the State have given in some respects a better road and a wider tunnel, it is nevertheless claimed that the improvements were unnecessary, do not cheapen transportation, and were made without the consent of the corporation being first asked and obtained. The act of 1862 authorized certain changes in alignment,

but only within the limits of expenditure therein prescribed.

The question what is to be done, is now before the legislature; the public will await the decision with great interest.

It was observed by Mr. Kalmbach when he visited the Hoosac Tunnel that pounds of nitro-glycerine were used where ounces, properly applied, would have sufficed, and that at the time when he visited the work the use of nitro-glycerine was so excessive that he would have been willing to do the whole work in his own way for what the nitro-glycerine was costing.

But all other wasteful and unnecessary expenditures have been thrown in the shade by the alterations in the road between Greenfield and the tunnel. It must be remembered that this portion of the road, as originally located and constructed under the provisions of the act of 1860, possessed characteristics superior to and a capacity for business greater than any other portion of the line. Improvement was therefore utterly useless until the capacity of other portions were increased, and even then improvements would only have been needed at the points of maximum resistance.

We are informed that in the location of the

Pennsylvania Railroad, which now carries ten millions of tons annually, distance saved was estimated as worth \$53,000 per mile of additional cost, but on the Troy & Greenfield Railroad the State has thrown away several millions without any reduction of distance, the half mile gained by alterations in the valley of the Deerfield having been lost at the Greenfield end by the new line into that town. All these millions expended east of the tunnel will not cheapen transportation appreciably, or increase to any extent the capacity of the line, and the alterations appear to have been an engineering blunder of the gravest magnitude.

We have tried to show where money has been sunk by the State without conferring any value upon the property, and to complete the aggregate, over three millions of interest must be added. Had the tunnel remained in the hands of the company not a dollar of interest would have been paid by the State, and the sinking fund would have taken care of the principal at maturity. Instead of imposing a burden of seventeen millions upon the Commonwealth, there would not have been one cent, if the status in 1861 had remained undisturbed.

### VALUE OF THE HOOSAC TUNNEL.

In the fall of 1874 Ex-Gov Clafin made a speech in Boston at a public meeting, and stated that parties of responsibility, while he was Governor, offered \$7,000,000 for the Hoosac Tunnel. He said substantially,—

I have been blamed by some of the enemies of that enterprise for not selling the tunnel at that time, as I was at the time by some of its strongest friends for entertaining any such proposition; but I felt very much as I should feel if I had a very fine young horse, which I had raised, and which I had intended to keep; if parties came along who wanted to purchase him very much, I should get their best offers for him. I should have him valued in the market, I should find how much others thought he was worth. Now that was just my position relative to the tunnel. I felt that if any corporation or people wanted to purchase it, in its unfinished state, they did so because it had a value; and as the chief magistrate of the Commonwealth, I thought it wise to get the opinion of experts in railroad property to fix its cash value to them; they offered \$7,000,000 for it, and I concluded after all that the Hoosac Tunnel, even then, had a cash value as a part of the assets of this State. Since that time the State has expended three million dollars on this enterprise, which these parties would have been obliged to expend had they purchased it. This shows what these competent railroad men thought the Hoosac Tunnel was worth to them, and it is worth many, many times as much to the people of this State.

### MEMORIAL OF TROY & GREENFIELD RAILROAD COMPANY.

The full text of the Memorial is to be found in Senate Doc. 48 of 1876. Only a brief extract will be given.

The Memorial recites the legislation and contracts from 1848 to 1862. It claims that under the Act of 1860 the work was being successfully prosecuted under the supervision of a State engineer, appointed by the Governor and Council, and in exact compliance with all the requirements of statute. That conclusive evidence had been afforded of the ability of the company to complete their road and tunnel without further aid than the \$2,000,000 loan of credit. That in 1861 a suspension of operations was caused by acts of State officers, which subsequent investigations determined to have been improper and in violation of good faith, and not from any failure or neglect on the part of the corporation or its contractors. That notwithstanding these conclusions, the State authorities insisted

that the corporation should surrender all its property into the hands of commissioners to be appointed by the Governor and Council. That such surrender was agreed to be made on condition of the passage of an Act, in the nature of a contract, guaranteeing the right of redemption for ten years after the completion of the tunnel, and limiting the expenditures to \$2,000,000.

In this Act it is provided,—

1. "That the right of redemption shall not be barred until ten years have elapsed after said railroad and Tunnel are completed, and the same opened for use.

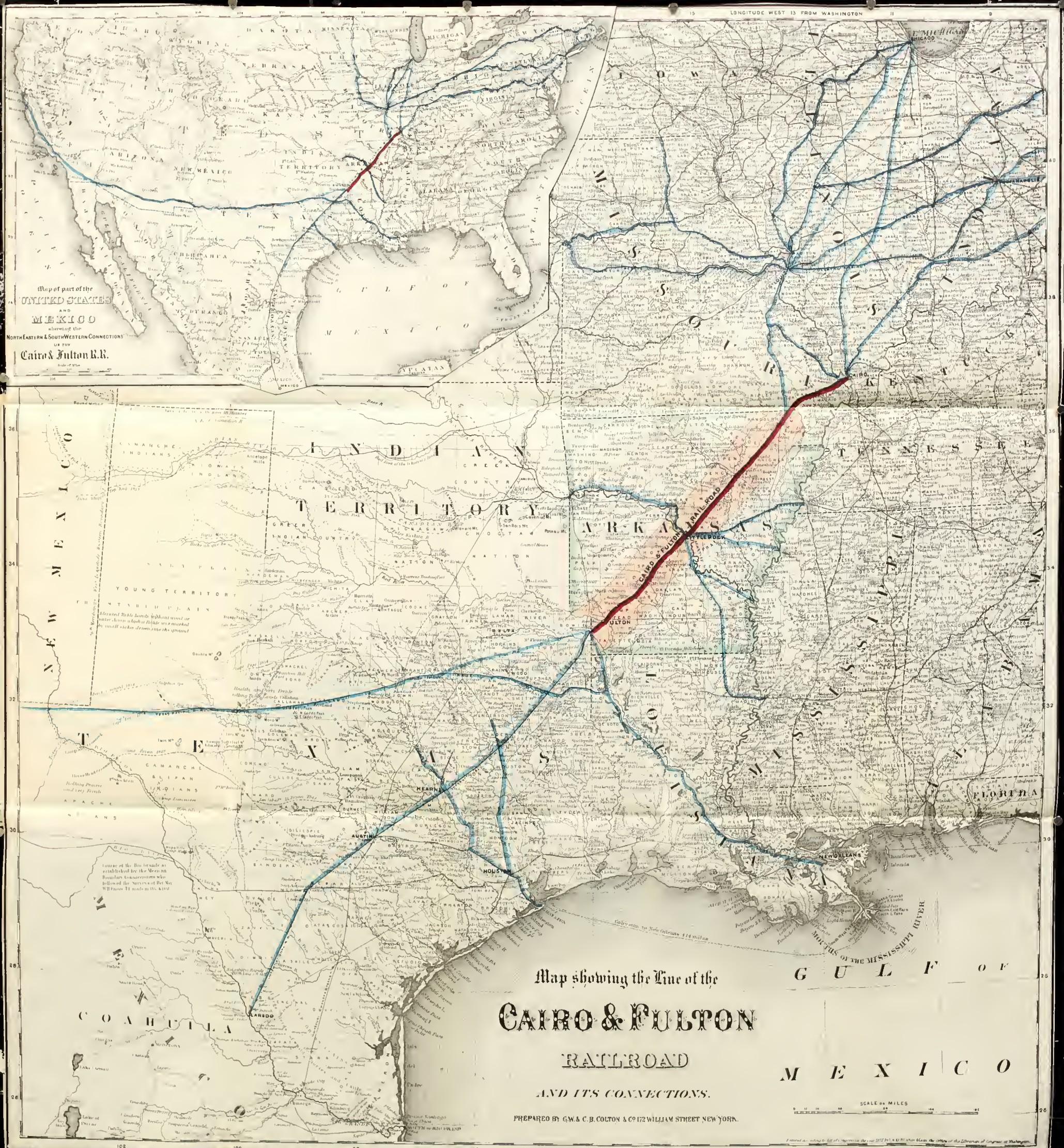
2. "That all expenditures and advances made under and by virtue of this Act shall be on account and form part of the two millions of dollars authorized to be loaned in State scrip to the Troy & Greenfield Railroad Company, by chapter two hundred and twenty-six of the Acts of eighteen hundred and fifty-four; and said expenditures and advances, together with all sums hitherto advanced to said company, excepting the sums advanced on account of the 'Southern Vermont Railroad,' shall not exceed in amount the said two millions of dollars.

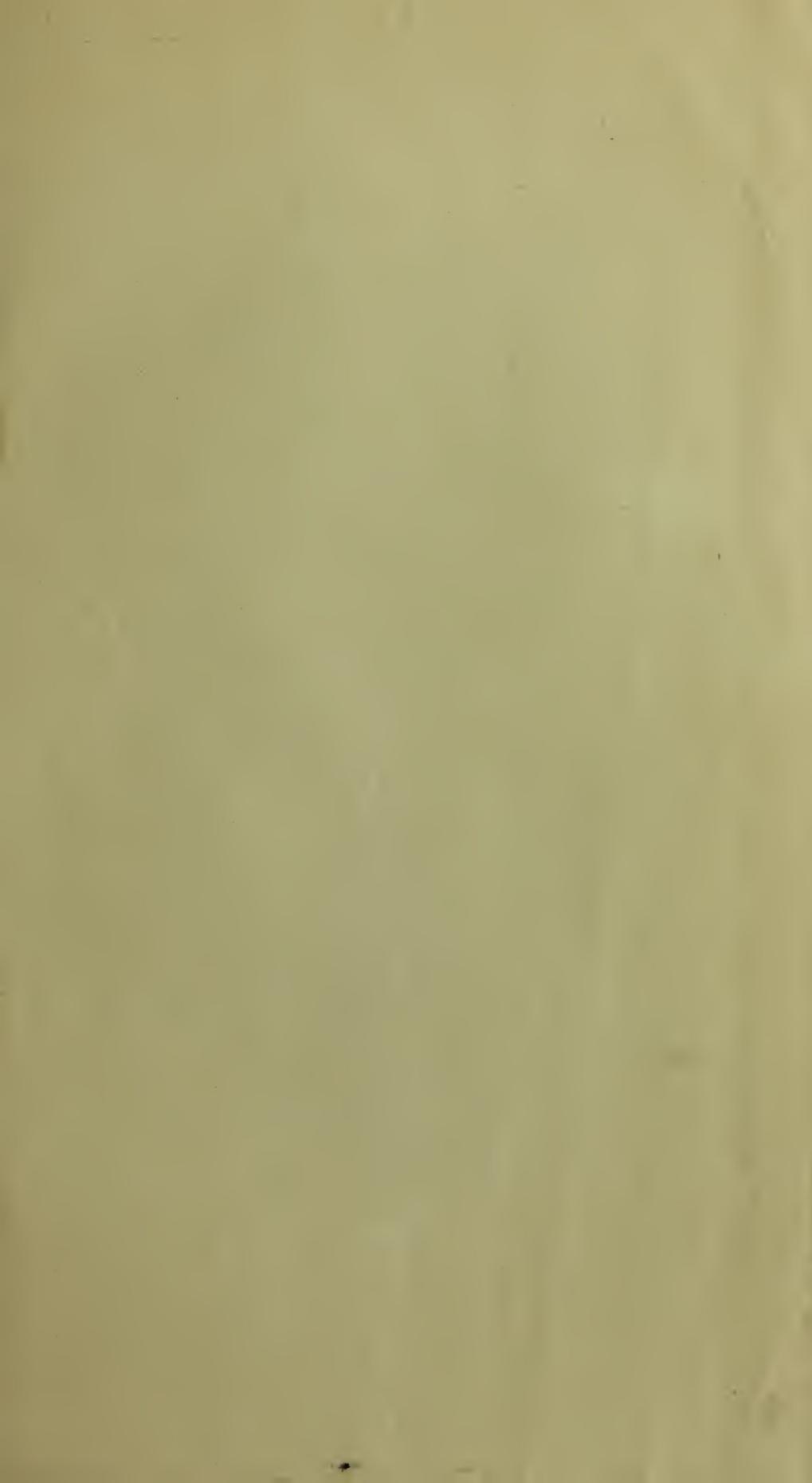
3. "No lease shall be made of the portion of the road east of the Tunnel for a term exceeding six years."

The closing paragraph of the Memorial is as follows:—

As your Memorialists, more than thirteen years ago, under the circumstances, and reserving the rights above mentioned, surrendered to the State their property on which they had then expended more than a million of dollars in excess of all advances on account of State loans, and as it is now confidently expected that the Hoosac Tunnel will be completed before the meeting of another legislature, your Memorialists, at this, the earliest period practicable, desire to provide for the exercise of the rights reserved to them in chapter 156 of the Acts of 1862, above referred to; and as the Company has made several payments into the sinking fund, and is entitled to the accumulations thereof as an offset in reducing the amount to be paid, your Memorialists, therefore, pray your honorable bodies to take such action as will be necessary to determine by impartial referees or otherwise what credits should be allowed, and what balance it is necessary for this Company to pay, in order to be reinstated in possession of their property, and what terms and conditions in regard to such payment will be required by the Commonwealth.









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